IC 22-10-7

Chapter 7. Ventilation and Mine Gases

IC 22-10-7-1

Fans; location; alarm; power circuits; combustible materials; inspection; failure or stoppage; continuous operation; source of power; pressure gauge

Sec. 1. (a) All mines shall be ventilated by means of main fans installed as follows:

(1) On the surface.

(2) In fireproof housings.

(3) Offset not less than fifteen (15) feet from the nearest side of the mine opening; however, this does not apply to present fans that are offset any distance from the mine opening if they otherwise comply with this subsection and were installed before March 8, 1955.

(4) Equipped with fireproof air ducts and ample means of pressure relief.

(5) The fan may be directly in front of, or over, the mine opening if the opening is not in direct line with possible forces coming out of the mine if an explosion occurs and there is another opening having a weak-wall stopping or explosion doors that would be in direct line with the forces coming out of the mine if an explosion occurs, such opening to be not less than fifteen (15) feet nor more than one hundred (100) feet from the fan opening.

(b) Main mine fans shall be installed to permit the reversal of air flow and unless the fan is attended constantly, shall be provided with an automatic device to give alarm when the fan slows down or stops. This device shall be placed so it will be seen or heard by a responsible person.

(c) At all mines, main fans shall be on separate power circuits, independent of any circuit entering the mine.

(d) The area surrounding main fan installations shall be kept free of combustible material for at least one hundred (100) feet in all directions, where physical conditions permit.

(e) All main fans shall be inspected daily by a person qualified and designated by the operator to make such inspections to ensure the electrical and mechanical reliability of such fans; and a record shall be kept of the inspection.

(f) When the main fan fails or stops, immediate action shall be taken to cut off all power and withdraw the workers from the face regions of the mine. If ventilation is restored within fifteen (15) minutes, the regions and other places where methane is likely to accumulate shall be re-examined by properly certified persons, and if found to be free from explosive gas, power may be restored and work resumed. Where a mine is ventilated by multiple fans, and the split system of ventilation is employed, this subsection shall apply only to the area that is affected by such failure.

(g) When the main fan of a mine fails or stops and cannot be

started within fifteen (15) minutes, the workers shall be withdrawn from the mine. After ventilation is restored, the mine shall be reexamined by properly certified persons, and, if found free from explosive gas, power may be restored and work resumed. If a mine is ventilated by multiple fans and the split system of ventilation is used, this subsection applies only to the area that is affected by the failure.

(h) Main fans shall be operated continuously except when the mine is shut down with all men out of the mine. In such event, after the fan has been started, the mine shall be examined for gas and other hazards and made safe before men, other than the examiners, and those necessary to correct the condition are permitted in the mine.

(i) Where electric power is available, main mine fans shall not be powered by means of internal-combustion engines. Where electricity is not available, internal-combustion engines may be so used. Internal-combustion engines may also be used for "stand-by" power to drive fans. Where internal-combustion engines are used, as provided, they shall not be set in the current of air caused by the fan operation, and the exhaust discharge shall be located so as to preclude the possibility of exhaust gases entering the mine. Such engines shall be in a fireproof structure.

(j) Main fans at mines shall be provided with pressure-recording gauges. A U-tube type pressure gauge may be used in lieu of a pressure recording gauge if the operator can satisfy the director that the results will provide no less than the same protection for the miners.

(Formerly: Acts 1955, c.168, s.49.) As amended by Acts 1979, P.L.231, SEC.8; P.L.112-1992, SEC.8; P.L.1-1993, SEC.189.

IC 22-10-7-2 Repealed

(*Repealed by P.L.231-1983, SEC.20.)*

IC 22-10-7-2.5

Auxiliary fans and tubing; requirements

Sec. 2.5. In the event that auxiliary fans and tubing are used in lieu of or in conjunction with a line brattice system to provide ventilation of the working face, the following apply:

(1) The fans shall be of a permissible type, maintained in permissible condition, so located and operated to avoid any recirculation of air at any time, and inspected frequently by a certified person when in use. Fans approved and maintained under Bureau of Mines Schedule 2G or 2F will meet the requirements of this section.

(2) In places where auxiliary fans are used, accumulations of methane resulting from unscheduled stoppage of the main fan shall be removed after restoration of normal mine ventilation by conducting the air current into the place with line brattice or the equivalent. Auxiliary fans shall not be operated in such place during stoppage of normal mine ventilation until methane accumulations have been removed.

(3) If the auxiliary fan is stopped or fails, the electrical equipment in the place shall be stopped and the power disconnected at the power source until ventilation in the working place is restored. During such stoppage, the ventilation shall be through the primary air current conducted into the place in a manner preventing the accumulation of methane.

(4) In places where auxiliary fans are used, the ventilation during scheduled idle periods such as weekends and idle shifts shall be through the primary air current conducted into the place in a manner preventing the accumulation of methane.

(5) If the air passing through the auxiliary fan or tubing contains one (1) volume per centum or more of methane, the fan and other equipment in the working place shall be deenergized and ventilation improved to reduce the methane content to less than one (1) per centum.

(6) To insure that an adequate volume and velocity of air is supplied continuously to the working face where auxiliary fan and tubing are used for face ventilation, a line brattice or other approved device shall be installed in accordance with section 4 of this chapter before the auxiliary fan is stopped.

(7) All face ventilation systems using auxiliary fans and tubing or machine mounted diffusers shall be approved by the director.

As added by P.L.231-1983, SEC.13.

IC 22-10-7-3

Volume and velocity of air current; inspection

Sec. 3. (A) The volume and the velocity of the current of air shall be sufficient to dilute so as to render harmless, and to carry away, flammable or harmful gases.

(B) The operator, superintendent or foreman of every mine worked by shaft, slope, or drift shall provide and maintain for every mine, adequate ventilation. In all mines the quantity of air passing through the last open crosscut between the intake and return in any pair or sets of entries shall be not less than nine thousand (9,000) cubic feet of air per minute and more if necessary to dilute and render harmless and carry away flammable and harmful gases.

(1) All working faces from which coal is being cut, mined or loaded in a working section between the intake and return airways entries shall be ventilated with a minimum quantity of three thousand (3,000) cubic feet of air per minute and more if necessary to dilute and render harmless and carry away flammable and harmful gases.

(2) The quantity of air reaching the last crosscut in pillar sections may be less than nine thousand (9,000) cubic feet of air per minute if at least nine thousand (9,000) cubic feet of air per minute is being delivered to the intake of the pillar line.

(C) At least once each week, a properly certified person shall measure the volume of air entering the main intakes and leaving the main returns, the volume passing through the last open breakthrough in each active entry, the volume being delivered to the intake end of

each pillar line, and the volume at the intake and return of each split. A record of such measurements shall be kept in a book on the surface, and the record shall be open for inspection by interested persons. The mine foreman shall, immediately after the end of each month, mail to the director a true copy of such air measurements and shall indicate the number of persons in each split. Blanks for this purpose shall be provided by the director.
(Formerly: Acts 1955, c.168, s.51.) As amended by Acts 1979, P.L.231, SEC.9.

IC 22-10-7-4
Main intake and return air currents; separate openings; battery charging stations; transformer stations; circulation

Sec. 4. (a) The main intake and main return air currents in slope mines driven after March 8, 1955, shall be in separate openings. The main intake and main return air currents in a single shaft sunk after March 8, 1955, shall be separated by a curtain wall or partition substantially constructed of fireproof material.

(b) All entries driven in coal after March 8, 1955, shall be in sets of two (2) or more.

(c) Permanently installed battery-charging stations, transformer stations, and substations, except substations installed before March 8, 1955, shall be ventilated by separate splits of air conducted directly to the return air courses. Electrically operated pumps and compressors, portable substations, and battery-charging stations shall be in well-ventilated places.

(d) Changes in ventilation that materially affect the main air current or any split thereof shall be made when the mine is not in operation and with no men in the mine other than those engaged in changing the ventilation.

(e) Each mechanized mining section shall be ventilated with a separate split of intake air directed by overcasts, undercasts, or the equivalent.

(f) The ventilating current shall be circulated through the haulageways, travelways, and airways so as to reach all portions of the mine, and it shall be circulated through the entries and rooms around the ends of line brattice and along pillar lines.

(g) Ventilating current shall be conducted to the last breakthrough, or to the working faces by means of such stoppings, check doors, curtains, and brattice as may be necessary or required, in order to dilute, render harmless, and carry away the noxious and dangerous gases, smoke, and dust liberated therein.
(Formerly: Acts 1955, c.168, s.52.) As amended by Acts 1979, P.L.231, SEC.10; P.L.231-1983, SEC.14; P.L.112-1992, SEC.9.

IC 22-10-7-5
Oxygen, carbon dioxide, and methane; percentage in air; withdrawal of employees

Sec. 5. (a) All active underground working places in a mine shall be ventilated by a current of air containing not less than nineteen and

one-half percent (19.5%) of oxygen, not more than one-half percent (0.5%) of carbon dioxide, and no harmful quantities of other noxious or poisonous gases.

(b) If the air at an underground working face in a mine, when tested at a point not less than twelve (12) inches from the roof, face, or rib, contains more than one percent (1%) of methane, as determined by a methane detector approved by the United States Mine Safety and Health Administration, a permissible flame safety lamp, air analysis, or other recognized means of accurately detecting such gas, changes or adjustments shall be made at once in the ventilation in such mine so that such air shall not contain more than one percent (1%) of methane.

(c) If a split of air returning from active underground working places in a mine contains more than one percent (1%) of methane, as determined by a methane detector approved by the United States Mine Safety and Health Administration, a permissible flame safety lamp, air analysis, or other recognized means of accurately detecting such gas, changes or adjustments shall be made at once in the ventilation in such mine so that such returning air shall not contain more than one percent (1%) of methane.

(d) If a split of air returning from active underground working places in a mine contains one and one-half percent (1.5%) of methane, as determined by a methane detector approved by the United States Mine Safety and Health Administration, a permissible flame safety lamp, air analysis, or other recognized means of accurately detecting such gas, the employees shall be withdrawn from the portion of the mine endangered thereby, and all power shall be cut off from such portion of the mine until the quantity of methane in such split shall be less than one and one-half percent (1.5%).

(Formerly: Acts 1955, c.168, s.53.) As amended by P.L.243-1987, SEC.6.

IC 22-10-7-6

Breakthroughs; location

Sec. 6. (a) Breakthroughs shall be made in each room at least every sixty (60) feet (which dimension shall be the lineal distance along the rib of the block of coal between breakthroughs). Breakthroughs shall be made in each entry at least every eighty (80) feet (which dimension shall be the lineal distance along the rib of the block of coal between breakthroughs). When undercut or sheared, or undercut and sheared, the entry and breakthrough, or the room and breakthrough may be advanced concurrently, but the rooms and entries shall not be advanced more than two (2) cuts until the last breakthrough shall have been completed. With the approval of the director, greater distances than specified in this section may be allowed. Any operator of a mine desiring such alterations shall file a written request to do so with the director together with a map of the mining and ventilating system for which approval and permission is asked, attached to the application, and the maps shall be a part of the records in the office of the director.

(b) Breakthroughs between intake and return air courses shall be closed, except the three (3) nearest the face; breakthroughs between rooms shall be closed where necessary to provide adequate ventilation at the working face.

(c) Where possible, a breakthrough shall be provided at or near the face of each entry or room before the working place is abandoned.

(d) Entries or rooms shall not be started off any entry beyond the last open breakthrough. However, room necks and entries not to exceed two (2) cuts in depth may be turned off an entry beyond the last open breakthrough if such room necks or entries are kept free of accumulations of methane by use of line brattice or other adequate means.

(e) On entries other than room entries, stopping in breakthroughs between intake and return airways shall be built of solid, substantial, incombustible material.

(f) Stopping shall be reasonably airtight.

(Formerly: Acts 1955, c.168, s.54; Acts 1971, P.L.358, SEC.8.) As amended by P.L.231-1983, SEC.15; P.L.2-1995, SEC.85; P.L.165-1997, SEC.6.

IC 22-10-7-7

Air locks; overcast; undercast; doors

Sec. 7. (a) The ventilation shall be so arranged by means of air locks, overcasts, or undercasts that the passage of trips or persons along the entries will not cause interruptions of the air current; however, when air locks are impracticable, single doors may be used. Where single doors are used, they must be attended constantly while the section of the mine controlled by such doors is in operation, unless they are operated mechanically, except that doors in or between panel or room entries need not be attended if all persons who pass through such doors are instructed to close them promptly. Air locks shall be ventilated enough to prevent accumulations of methane therein.

(b) All doors used in guiding and directing the ventilating currents shall be hung and adjusted so as to close automatically.

(c) Overcasts and undercasts shall be constructed tightly of incombustible material; they shall be of ample area to pass the required quantity of air and shall be kept clear of obstructions.

(Formerly: Acts 1955, c.168, s.55.) As amended by Acts 1979, P.L.231, SEC.11; P.L.231-1983, SEC.16.

IC 22-10-7-8

Brattices; removal of gases

Sec. 8. (a) Substantially constructed line brattice shall be used from the last open breakthrough of an entry or room when necessary to provide adequate ventilation to within ten (10) feet, or a greater distance as may be approved by the director, from fall of the coal or solid face and to remove explosive gases and fumes. When damaged by falls or otherwise, they shall be repaired promptly.

(b) The space between the line brattice and the rib shall be free of any obstruction to provide for the adequate coursing of air. However, this does not exclude the use of auxiliary tubing or ventilation control devices in that space.

(c) Brattice cloth used underground shall be of flame-resistant material.

(Formerly: Acts 1955, c.168, s.56.) As amended by Acts 1979, P.L.231, SEC.12; P.L.243-1987, SEC.7.

IC 22-10-7-9

Idle or abandoned sections of mines; protection; inspection; sealing

Sec. 9. (A) All idle or abandoned sections of mines shall be protected by such safeguards as will prevent the accumulation or overflow of gas. All avenues leading thereto, shall be arranged and conducted to give warning to all persons of the danger of entering and notice shall be posted warning all unauthorized persons not to enter such parts of the mine.

(B) In all mines, air which has passed by an opening of any unsealed, abandoned area shall not be used to ventilate any active face area if such air contains one-quarter of one percent (0.25%) or more of methane. For the purposes of this subsection an area within a panel shall not be deemed to be abandoned until such panel is abandoned.

(C) In all mines, air that has passed through an abandoned panel which is inaccessible for inspection, or air that has passed through a similar abandoned area which is inaccessible for inspection, or air which has been used to ventilate a pillar line, or air which has been used to ventilate an area from which the pillars have been removed, shall not be used to ventilate any active face area in such mine.

(D) In all mines, all workings which are abandoned after March 8, 1955, shall be sealed or ventilated to the extent that explosive gases will be dispersed into a direct return. If such workings are sealed, the sealing shall be done in a substantial manner, as prescribed by the director. One (1) or more of the seals of every sealed area shall be fitted with a pipe and cap or valve to permit the sampling of gases and the measuring of hydrostatic pressure behind such seals. For the purpose of this subsection, workings within a panel shall not be deemed to be abandoned until such panel is abandoned.

(Formerly: Acts 1955, c.168, s.57.) As amended by Acts 1979, P.L.231, SEC.13.

IC 22-10-7-10

Examination and inspection; frequency; reports and records

Sec. 10. (a) Examinations for gas and other dangerous conditions shall be made by means of a methane detector approved by the United States Mine Safety and Health Administration or by air analysis.

(b) Not less than two (2) methane detectors approved by the United States Mine Safety and Health Administration in proper

working condition shall be kept available at each mine for the use of authorized persons.

(c) Persons whose regular duties require them to inspect working places in mines for dangers shall have in their possession, and shall use, when underground, a suitable permissible device capable of detecting methane and oxygen deficiency.

(d) In all mines, within three (3) hours immediately preceding the beginning of a coal-producing shift, and before any workmen in such shift other than those who may be designated to make the examinations prescribed in this subsection enter the mine, properly certified foremen or fire-bosses designated by the operator shall make an examination, as prescribed in this subsection, of such mine. Such person so designated shall examine a definite underground area of such mine, and, in making his examination, such examiner shall:

(1) inspect every active working place in such area and make tests therein with a permissible device for oxygen deficiency in the air and with a methane detector approved by the United States Mine Safety and Health Administration for accumulation of methane;

(2) examine seals and doors in active work places to determine whether they are functioning properly;

(3) inspect and test the roof, face, and rib conditions in the working places and on active roadways and travelways;

(4) inspect active roadways, travelways, approaches to abandoned workings, and accessible falls in active sections for explosive gas and other hazards; and

(5) inspect to determine whether the air in each split is traveling in its proper course and in normal volume.

Such examiner shall place his initials, date, and time at or near the face of each working place he examines. If such examiner, in making his examination, finds a condition which he considers to be dangerous to persons who may enter or be in such area, he shall indicate such dangerous place by posting a "danger" sign conspicuously at a point which persons entering such dangerous place would be required to pass. No person, other than federal or state mine inspectors or persons authorized by the mine operator to enter such place for the purpose of eliminating the dangerous condition therein, shall enter such place while such sign is so posted. Upon completing his examination, such examiner shall report the result of his examination to a person designated by the mine operator to receive such reports at a designated station on the surface before other persons enter the mine to work in such coal-producing shift. Each such examiner shall also record the results of his examination with ink or indelible pencil in a book kept for such purpose at a place on the surface of the mine designated by the mine operator. No person other than a certified person shall enter any underground area of a mine on an idle day unless an examination of such area has been made by a certified person within three (3) hours preceding the beginning of the work shift.

(e) In all mines, an examination as prescribed in subsection (d)

shall be made within three (3) hours immediately before the entrance of workers on any shift.

(f) The underground working places in all mines shall be examined for hazards by properly certified persons designated by the mine operator to do so, at least once during each coal-producing shift, or more often if necessary for safety. In all mines, such examinations shall include tests with a permissible device for methane and oxygen deficiency. In addition, the following provisions apply:

(1) No electric face equipment shall be brought within the last breakthrough next to the working face until the equipment operator has made an inspection for explosive gas using a permissible device unless the examination is then made by some other competent person authorized and appointed for the purpose by the mine foreman. If any explosive gas is found in the working place, the electric equipment shall not be taken in until the gas is removed.

(2) While the electric equipment is operating at the face, an examination for gas shall be made at not more than twenty (20) minute intervals by a qualified person. If gas is found in excess of one percent (1%), the power shall be disconnected until the gas is removed and the place reported safe by a person qualified in methane detection.

(g) In all mines, immediately before a roof fall is made in pillar workings, such workings shall be examined to ascertain whether methane is present. If in such examination methane is found in amounts in excess of five-tenths of one percent (0.5%), a roof fall shall not be made until such gas is removed.

(h) Idle or abandoned sections shall be inspected for gas and other dangerous conditions by a properly certified foreman or fire-boss immediately before other employees are permitted to enter or work in such places. A properly certified foreman or fire-boss shall personally supervise the correction of exceptionally dangerous conditions. Idle or abandoned sections shall be examined at least every seven (7) days by a properly certified person.

(i) Examinations for dangerous conditions, including tests for methane with a permissible methane detector approved by the United States Mine Safety and Health Administration, or by chemical analysis shall be made at least once each week by the mine foreman or other properly certified person designated by the mine foreman. However, the weekly examination need not be made during any week in which the mine is idle for the entire week. Such examinations and tests shall be made in the return of each split where it enters the main return, on pillar falls, at seals, in the main return, at least one (1) entry of each intake and return airway in its entirety, idle workings, and, insofar as conditions permit, abandoned workings. If the state mine inspector or director determines that a hazardous condition exists and more examinations for dangerous conditions are necessary, the examinations must be made more often than once a week. The person making such examinations and tests shall mark his

initials and the date at the places examined, and if dangerous conditions are found, they shall be reported promptly. A record of these examinations and tests shall be kept at the mine.

(j) Where there are falls of the roof near the places of abandoned workings where what is known as a "squeeze" exists in any section of the mine, certified officials shall make necessary inspections to obtain advance knowledge of the presence, existence, or approach of dangerous gases or other dangerous conditions in ample time to furnish warning to all persons endangered by such condition. When any such conditions are found to exist, all persons in such dangerous section or sections shall be withdrawn from the mine until such dangerous conditions no longer exist.

(k) The mine foreman shall read and countersign promptly the daily reports of the fire-bosses and assistant mine foremen, and he shall read and countersign promptly the weekly report covering the examinations for dangerous conditions. Where such reports disclose dangerous conditions, the mine foreman shall take prompt action to have such conditions corrected. The mine superintendent or assistant mine superintendent where such official is in charge at the mine, shall also read and countersign the daily and weekly reports of the mine officials.

(l) Each day, the mine foreman and section foreman shall enter plainly and sign with ink or indelible pencil in a book provided for that purpose a report of the conditions of the mine or portion thereof under his supervision, which report shall state clearly the location and nature of any danger observed by them or reported to them during the day, and the report shall state what action, if any, was taken to remedy such danger.

(m) All records of daily and weekly reports, as prescribed herein, shall be open for inspection by interested persons.

(Formerly: Acts 1955, c.168, s.58.) As amended by Acts 1979, P.L.231, SEC.14; P.L.231-1983, SEC.17; P.L.243-1987, SEC.8; P.L.112-1992, SEC.10; P.L.165-1997, SEC.7.